

Claims

1. A conduit, comprising:  
a main member, comprising a wall having at least one opening defined in the wall;  
and  
at least one side-branch member connected to the main member;  
wherein the at least one side-branch member is extendable through the at least one opening from within the main member.
2. The conduit of claim 1, wherein at least one of the main member and the at least one side-branch member comprises:  
a graft material; and  
a support supporting at least a portion of the graft material.
3. The conduit of claim 2, wherein the support comprises at least one of a stent, a barb, an adhesive, and a pin.
4. The conduit of claim 1, further comprising at least one balloon catheter releasably attached to at least one of the main member and the at least one side-branch member.
5. The conduit of claim 1, further comprising at least one of a balloon catheter, a guiding catheter, a guidewire, or a deployment tube disposed within at least one of the main member and the side-branch member.
6. The conduit of claim 1, further comprising a delivery system having at least one sheath configured to retain at least one of the main member and the at least one side-branch member.
7. The conduit of claim 1, further comprising a flange connected to the at least one side-branch member and to the wall of the main member around the opening.
8. The conduit of claim 1, wherein at least one of the main member and the at least one side-branch member is circumferentially distensible.
9. The conduit of claim 1, wherein at least one of the main member and the at least one side-branch member includes at least one of polytetrafluoroethylene, polyurethane, polyethylene, polyether sulfone, and polyester.

10. The conduit of claim 1, wherein at least one of the main member and the at least one side-branch member includes at least one of a film-tube, extruded tubing, braided tubing, and textile tubing.
11. The conduit of claim 1, wherein at least one of the main member and the at least one side-branch member is treated for at least one of elution of drugs, biocompatibility, radioactivity, and radiopacity.
12. The conduit of claim 1, wherein the at least one side-branch member is configured to be extended through the opening by at least one of a balloon catheter, a snare, or a deployment tube.
13. The conduit of claim 1, wherein at least one of the main member and the at least one side-branch member is kink resistant.
14. The conduit of claim 1, wherein at least one of the main member and the at least one side-branch member may be distended with at least one of minimal foreshortening and low recoil.
15. A conduit, comprising:
  - a main member, comprising:
    - a main member graft material defining a side opening; and
    - a main member stent supporting at least a portion of the main member graft material; and
  - a side-branch member disposed within the main member and configured to be extended through the side opening, comprising:
    - a side-branch member graft material, wherein side-branch member graft material is connected to the main member graft material around the side opening; and
    - a side-branch member stent supporting at least a portion of the side-branch member graft material.
16. The conduit of claim 15, further comprising at least one of a balloon catheter, a guiding catheter, a guidewire, or a deployment tube disposed within at least one of the main member and the side-branch member.

17. The conduit of claim 15, wherein the proximal end of the side-branch member includes a flange connected to the main member graft material around the side opening.
18. The conduit of claim 15, wherein at least one of the main member and the side-branch member is circumferentially distensible with at least one of minimal foreshortening and low recoil.
19. The conduit of claim 15, wherein at least one of the main member and the at least one side-branch member includes at least one of polytetrafluoroethylene, polyurethane, polyethylene, polyether sulfone, and polyester.
20. The conduit of claim 15, wherein at least one of the main member and the at least one side-branch member includes at least one of a film-tube, extruded tubing, braided tubing, and textile tubing.
21. The conduit of claim 15, wherein at least one of the main member and the at least one side-branch member is treated for at least one of elution of drugs, biocompatibility, radioactivity, and radiopacity.
22. The conduit of claim 15, wherein the side-branch member is configured to be extended through the side opening by a balloon catheter.
23. The conduit of claim 15, wherein at least one of the main member and the side-branch member is kink resistant.
24. A system for implanting a conduit with at least one side-branch in a vessel, comprising:
- a main member comprising a wall having an opening; and
  - at least one side-branch member connected at a proximal end to the main member at the opening, wherein the at least one side-branch member is configured to be extended from within the main member through the opening; and
  - a delivery system engaging at least one of the main member and the at least one side-branch member for implanting the main member and the at least one side-branch member in the vessel.

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25. The system of claim 24, wherein the delivery system includes:  
a main guidewire configured to be inserted into the vessel; and  
a side-branch guidewire configured to be inserted into a side-branch of the vessel.
26. The system of claim 25, wherein the delivery system further comprises:  
a main balloon catheter releasably attachable to the main member and slidably attachable to the main guidewire; and  
a side-branch balloon catheter releasably attachable to the at least one side-branch member and slidably attachable to the side-branch guidewire.
27. The system of claim 24, wherein the delivery system includes a deployment tube configured to engage the at least one side-branch member.
28. The system of claim 24, wherein the delivery system includes at least one sheath configured to retain at least one of the main member and the at least one side-branch member.
29. The system of claim 28, wherein the delivery system further includes a push element configured to engage at least one of the main member and the at least one side-branch member and move the at least one of the main member and the at least one side-branch member with respect to the sheath.
30. The system of claim 28, wherein the sheath has an aperture defined through a wall of the sheath, and the sheath aperture is aligned with the main member opening.
31. The system of claim 30, wherein the delivery system further comprises:  
a guidewire inserted into a side-branch of the vessel through the sheath aperture and the main member opening; and  
a balloon catheter adapted to be releasably attached to an end of the at least one side-branch member and advanced over the guidewire.
32. The system of claim 24, wherein the delivery system includes at least one guidewire adapted to be inserted into a vessel.
33. The system of claim 24, further comprising a deployment tube configured to engage the at least one side-branch member to extend the at least one side-branch member from within the main member through the opening.

34. A method for placing a conduit in a vessel having a vessel side-branch, comprising:  
 inserting a main member of the conduit into the vessel;  
 advancing the main member to a desired location with respect to the vessel side-branch;  
 extending a side-branch member from within the main member into the vessel side-branch.
35. The method of claim 34, wherein:  
 the inserting the main member includes inserting a sheath containing the conduit into the vessel; and  
 the advancing the main member includes advancing the sheath to the desired location.
36. The method of claim 34, wherein the extending the side-branch member includes engaging the side-branch member with a deployment tube.
37. The method of claim 36, wherein the deployment tube includes a hollow interior for accommodating a deployment element.
38. The method of claim 34, wherein:  
 the inserting the main member includes inserting at least one guidewire into the vessel; and  
 the advancing the main member includes advancing the conduit to the desired location over the at least one guidewire.
39. The method of claim 34, wherein extending the side-branch member includes:  
 inserting a guidewire into the vessel;  
 advancing the guidewire through the vessel and through the at least one side-branch member into the vessel side-branch;  
 placing a balloon catheter on the guidewire;  
 advancing the balloon catheter along the guidewire to a balloon location within the side-branch member; and  
 extending the side-branch member into the vessel side-branch using the balloon catheter.
40. The method of claim 39, wherein the extending a side-branch member includes engaging the side-branch member with a deployment tube.

41. The method of claim 40, wherein the deployment tube includes a hollow interior for accommodating a deployment element.

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